

ECO Series Impulse Amplifier

Single / double tap with different output functions

FEATURES

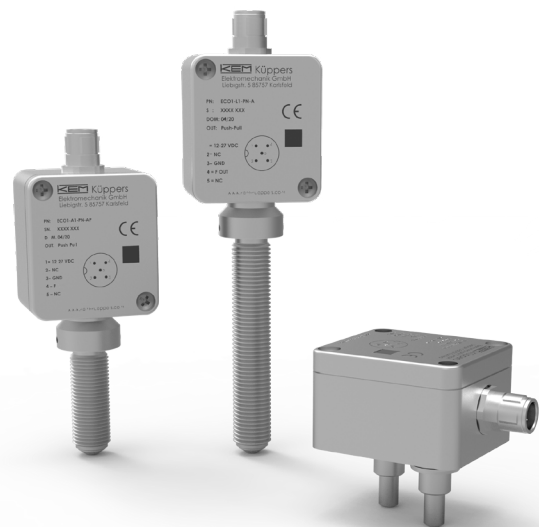
- Compact design for flow meters
- Medium temperatures up to +150°C [+302°F]
- Scalable analog and digital outputs
- Flow direction detection
- Customer configurable
- Linearisation with up to 20 points possible
- Integrated Medium Temp. Measurement

BENEFITS

- ▶ Suitable for all mechanical meters
- ▶ Wide range of applications with one device
- ▶ User-friendly same functionality for all Mechanical Meters
- ▶ Short delivery times
- ▶ Optimized for inventory

TECHNICAL DATA

Mounting:	Flush-Mount (1- or 2-Channel) Screw-In M14x1.5 (1-Channel)
Power Supply (Vcc):	12 ... 28 VDC, regulated
Current Consumption:	< 25 mA
Frequency Range:	1 ... 5.000 Hz; suitable for all KEM volumetric counters
Output Stages:	Push-Pull active, PNP, NPN NAMUR 4-20 mA passive + Freq/Pulse (NPN) 0-20 mA active + Freq/Pulse (PP, NPN, PNP) 0-10 V active + Freq/Pulse (PP, NPN, PNP)
Output Signal:	1:1- Frequency or Direction signal & doubled Frequency scaled output values LED indicator for status display
Temperature Measurement:	±1 °C ±0.5 %
Ambient Temperature:	-40 °C ... +60 °C [-40 °F ... +140 °F]
Medium Temperature:	Flush-Mount (1- or 2-Channel) -40 °C ... +80 °C [-40 °F ... +176 °F] Screw-In M14x1.5 (1-Channel) -40 °C ... +120 °C [-40 °F ... +248 °F] -40 °C ... +150 °C [-40 °F ... +302 °F]
Housing Material:	Aluminium die casting alloy 231 or Stainless Steel
Sensor Probe Material:	1.4404 [AISI 316L] all Variants
Protection Class:	Aluminium IP65 Stainless Steel IP66 / 67 / 68 with closed electrical connection
Weight:	approx. 200 g

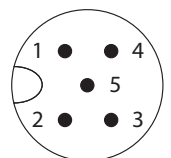


ELECTRICAL CONNECTION

(Short circuit proof, Reverse polarity protected)
M12 Connector (5-pole, male, A-coded)

Pin

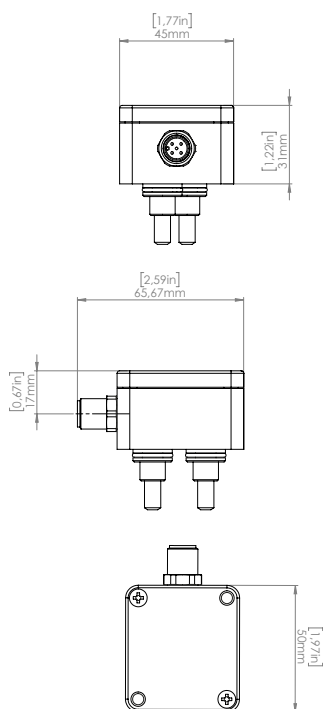
1	+U _b / Loop+ (24 V)
2	Digital Output 2 / NAMUR
3	GND / Loop-
4	Digital Output 1 / NAMUR
5	Active Analog Output



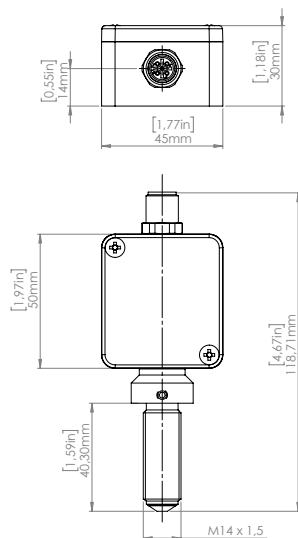
¹⁾ Deviation 0.1% ± 50 ppm / K FS

DIMENSIONS

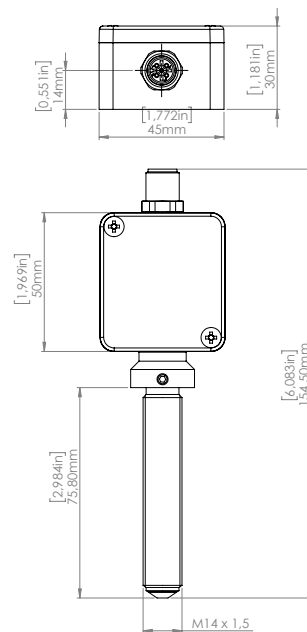
Flush-Mount (1- or 2-Channel)
-40 °C...+80 °C [-40 °F...+176 °F]



Screw-in M14x1.5 short (1-Channel)
-40 °C ... +120 °C [-40 °F ... +248 °F]



Screw-in M14x1.5 long (1-Channel)
-40 °C ... +150 °C [-40 °F ... +302 °F]



MODEL CODE

	ECO	X	X	-	X	X	-	X	X	-	X
Mounting											
Flush-mount / ZHM 01/3-03 [+80°C; +176°F]		C									
Flush-mount / ZHM 04 [+80°C; +176°F]		E									
Screw-in M14x1.5 [+120°C; +248°F] / ≤ZHM 04, SRZ & HM		K									
Screw-in M14x1.5 [+150°C; +302°F] / ZHM, SRZ & HM		L									
Channel											
1-Channel			1								
2-Channel [DIR, 2 x f] (not available with "Mounting" K & L)			2								
Output Function											
Freq/Pulse+ (PP, NPN, PNP)					P						
Namur Output					N						
4-20mA passive+ Freq/Pulse (NPN)					A						
Advanced Output Function											
None					N						
0-20mA aktiv + Freq/Pulse (PP, NPN, PNP)					V						
0-10V + Freq/Pulse (PP, NPN, PNP)					W						
LED indicator ²⁾					I						
Housing / Sensor / IP											
Aluminum / 1.4404 [AISI 316L] / IP 65								A			
Stainless / 1.4404 [AISI 316L] / IP66 / 67 / 68								S			
Connector											
M12 Connector (5-pole, male, A-coded), material equivalent housing									P		
Explosion Protection											
None										-	
ATEX + IECEx + cCSAus (Zone 0) ³⁾										Ex	

²⁾ only in combination with output function "P" and housing/sensor/IP protection "A".

³⁾ not in combination with extended output function "V" and "W".

Additional conditions for North American CSA certification:

Only ECOs with product code T*10 and an M12 stainless steel plug, can be used as Type 3 for outdoor use. All other configurations may only be used indoors.

OUTPUT STAGES ELECTRICAL VALUES

NPN		R_{load} I_{load} $U_{ext.}$ $+U_b$	min. 10 kΩ 11,5 V	max. 15 mA 28 V 28 V	$V_{outlow} = 1800 \Omega \times I_{load}$
PNP		R_{load} I_{load} U_{load} $+U_b$	min. 10 kΩ 11,5 V	max. 15 mA 28 V 28 V	$V_{outhigh} = +U_b - 0,5 V - (1800 \Omega \times I_{load})$
Push-Pull		R_{load} I_{load} U_{load} $+U_b$	min. 10 kOhm 11,5 V	max. 15 mA 28 V 28 V	$V_{outlow} = 1800 \Omega \times I_{load}$ $V_{outhigh} = +U_b - 0,5 V - (1800 \Omega \times I_{load})$
NAMUR		R_{ilow} R_{ihigh} $U_{ext.}$ $+U_b$	min. typ. typ. 11,5 V	max. 1525 Ω 10 kΩ 12 V 28 V	
4-20 mA passive + Frequency/ pulse (NPN)		R_{burden} I_{loop} $+U_b$ +NPN	min. 21,6 V	max. 600 Ω 21 mA 28 V 28 V	$R_{burden max.} = (+U_b - 21,6) / 0,004 A$ $+U_b = 21,6 V + (R_{burden} \times 0,004 A)$ like NPN
4 - 20 mA active + Frequency/ pulse (PP, PNP, NPN)		R_{burden} I_{loop} U_{out} $+U_b$ +NPN +PNP +PP	min. 11,5 V 11,5 V	max. 1000 Ω 21 mA 25 V 28 V 28 V	For burden > 350 Ω: $R_{burden max.} = ((+U_b - 11,5 V) / 0,021 A) + 350 \Omega$ $+U_b = 11,5 V + (0,021 A \times (R_{burden} - 350 \Omega))$ like NPN like PNP like PP
0 - 10 V active + Frequency/ pulse (PP, PNP, NPN)		R_{load} I_{load} U_{out} $+U_b$ +NPN +PNP +PP	min. 10 kΩ 15 V 15 V	max. 25 + 15 mA 25 V 28 V 28 V	like NPN like PNP like PP

EX PROTECTION

Product Certification Code: T100 (Version: T100-ECO_D_EN_230130_E002)

Approvals

CSA-c	Ex ia IIC T4 Class I, Division 1, Groups A, B, C & D
CSA-us	Class I, Zone 0 AEx ia IIC T4
IECEX	Ex ia IIC T4 Ga
ATEX	II 1G Ex ia IIC T4 Ga

Temperature

-40°C ≤ Tamb ≤ +60°C -40°C ≤ Tproc ≤ +60°C	Without distance requirement
-40°C ≤ Tamb ≤ +50°C -40°C ≤ Tproc ≤ +80°C	Minimum distance of 30mm between the T100 housing and the mechanical meter top mounted.
-40°C ≤ Tamb ≤ +50°C -40°C ≤ Tproc ≤ +95°C	Minimum distance of 30mm between the T100 housing and the mechanical meter. A top mounted T100 is prohibited!

Design Values Supply and Puls/Frequency Outputs

Description	Connection ³⁾	U _i (V)	I _i (mA)	P _i (mW)	C _i (nF)	L _i (μH)
Power Supply	+24V / Loop+	28V	93	650	74.75	470
Digital Output 1	Dig. Out 1	28V	93	650	74.75	470
Digital Output 2	Dig. Out 2	28V	93	650	74.75	470

⁴⁾ to common ground [GND / Loop-]



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